在Catalyst 9800 WLC上配置VideoStream

目录

简介

本配置示例介绍如何在上配置VideoStream（ 也称为MediaStream或Multicast-Direct ） a Catalyst 9800系列无线控制器(9800 WLC)通过图形用户界面(GUI)。

先决条件

要求

Cisco 建议您了解以下主题：

- 9800 WLC配置指南
- WLC上的组播

使用的组件

本文档中的信息基于以下软件和硬件版本：

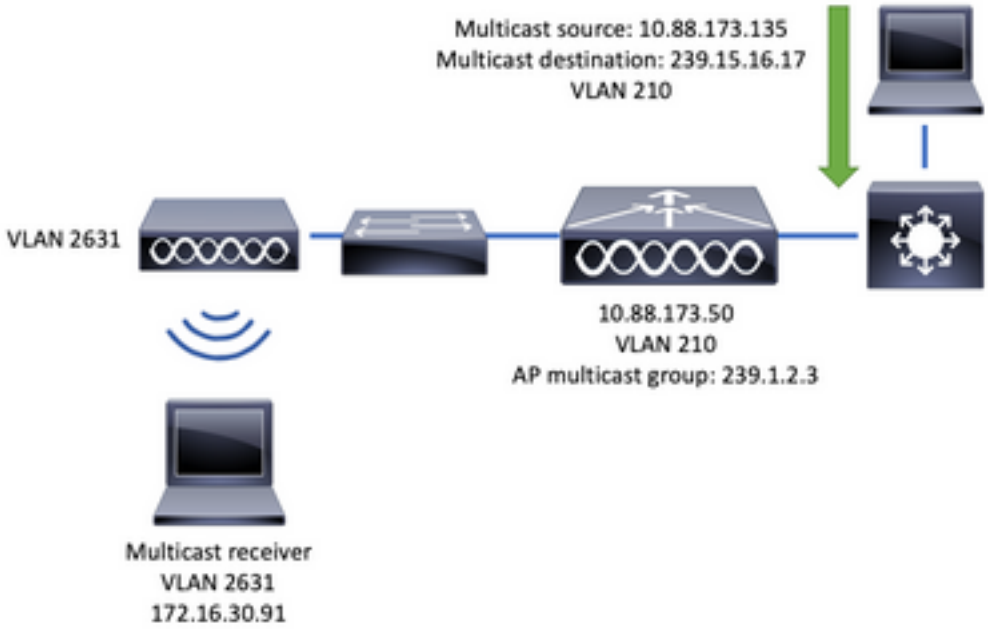
- Catalyst 9800系列无线控制器，IOS-XE版本16.11.1b
- Aironet 3700系列接入点

本文档中的信息都是基于特定实验室环境中的设备编写的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您的网络处于活动状态，请确保您了解任何配置的潜在影响。

配置

网络图

此示例基于本地模式AP集中交换流量。支持FlexConnect本地交换，但由于组播不通过WLC，AP是执行大部分工作的AP，因此流量会有所不同。

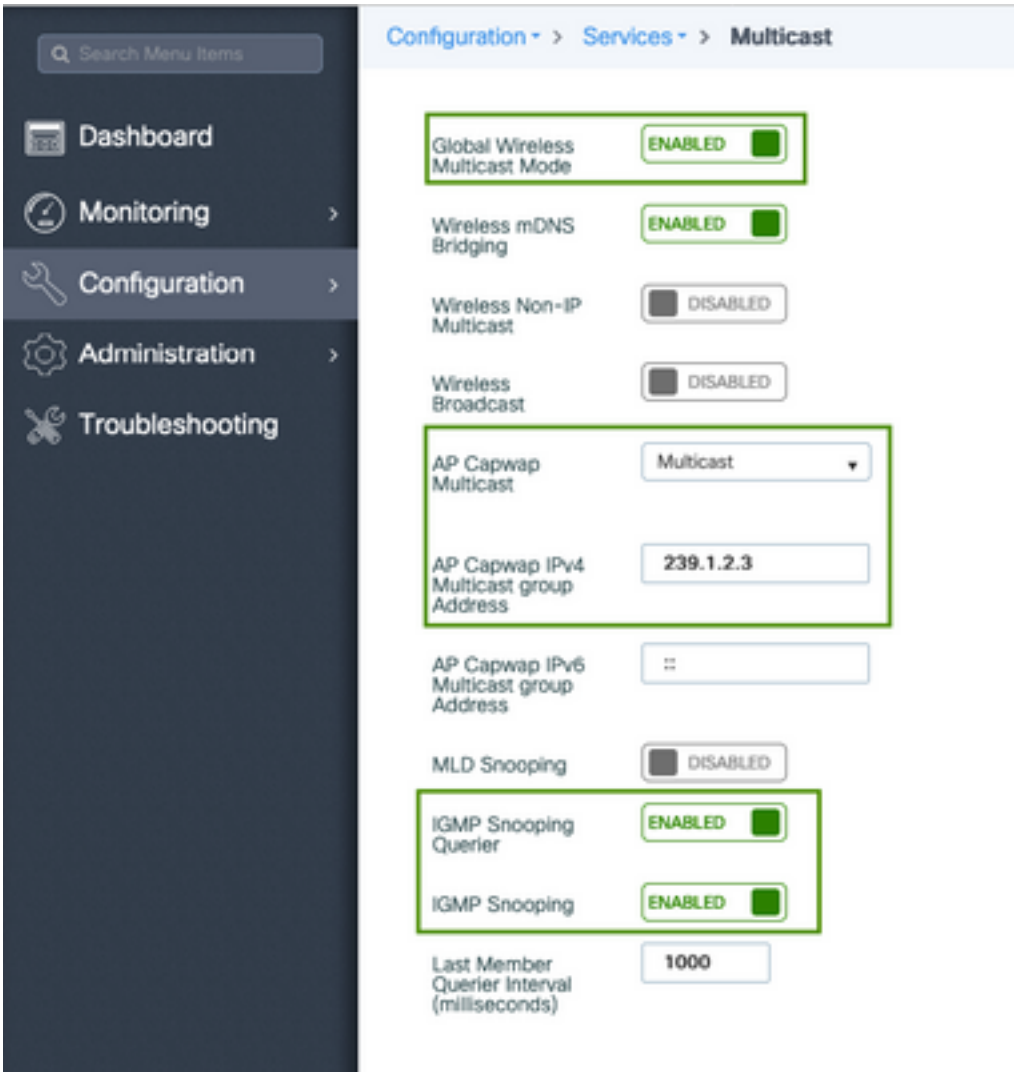


流量传输

1. 客户端（组播接收器）连接到服务集标识符(SSID):视频流
2. 客户端发送IGMP加入数据包以请求IP地址239.15.16.17上的视频
3. WLC创建L3 MGID并将IGMP加入转发到有线网络
4. 路由器将开始将流量从组播源(10.88.173.135)转发到WLC，VLAN 210和VLAN 2631之间需要组播路由
5. WLC知道无线客户端正在通过MGID请求此流量，并使用IP地址239.1.2.3 - AP组播组封装流量以将其发送到AP
6. AP接收数据包并将组播流量单播到无线客户端

配置组播

导航至： Configuration > Services > Multicast



运行下一命令以检验CLI配置。

```
9800-40-1#sh run all | sec wireless multicast|igmp snooping
.
.
ip igmp snooping querier
ip igmp snooping
.
.
wireless multicast
wireless multicast 239.1.2.3
```

在本例中，使用组播模式。在此模式下，WLC仅向配置的组播组（在本例中为239.1.2.3）发送一个数据包，因此只有对此流量感兴趣的接入点(AP)才能侦听它。有关可以配置哪些模式的详细信息，请参阅本9800系列无线控制器软件配置指南。

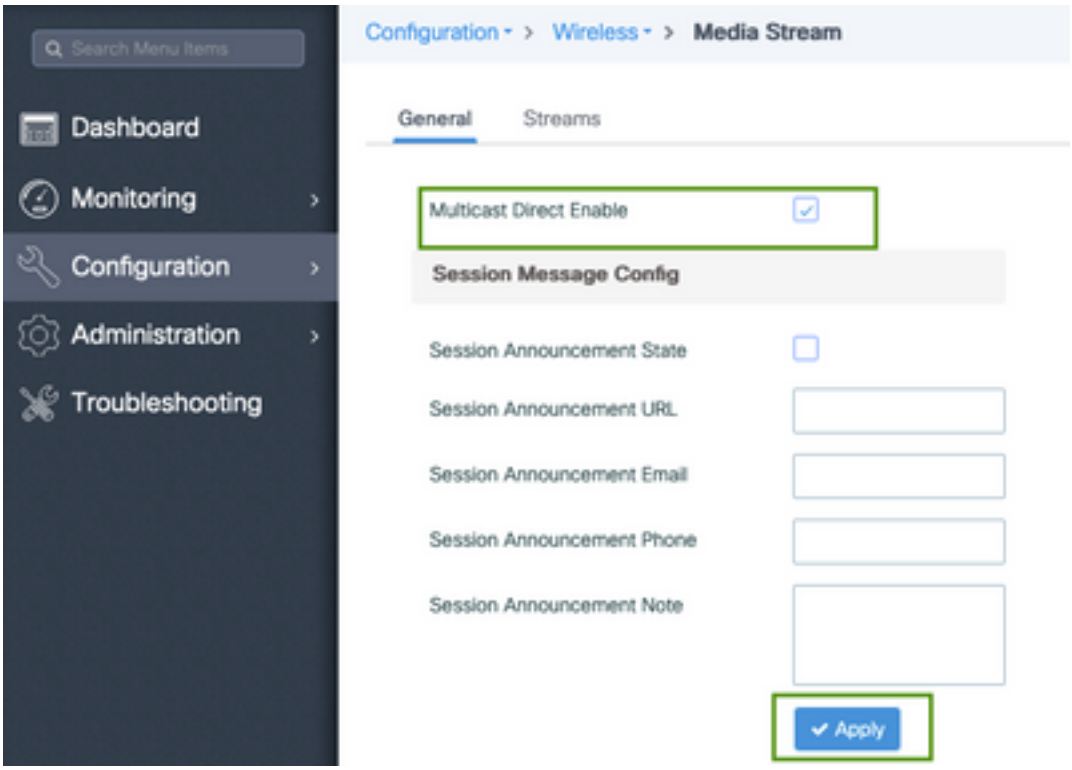
> **注意**：需要全局启用IGMP监听，并基于每个VLAN，以便WLC能够监听无线客户端的IGMP消息。

IGMP监听查询器有助于更新WLC表。验证特定组播组是否存在任何客户端非常有用。

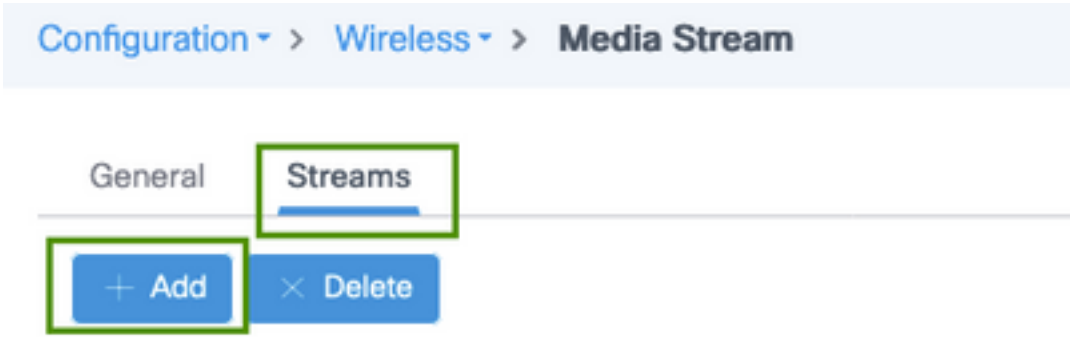
应用更改.

媒体流配置

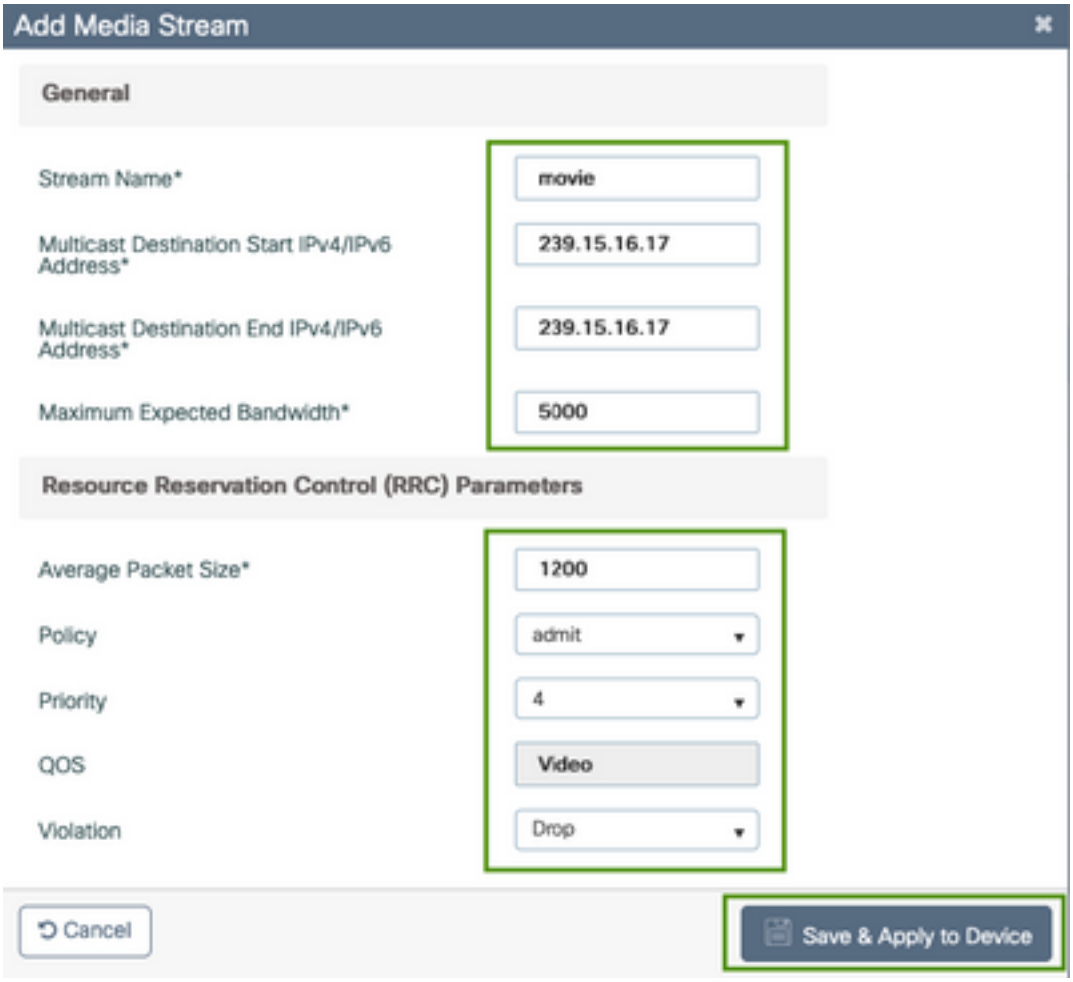
步骤1.全局启用媒体流：Configuration > Wireless > Media Stream > Tab "General"



步骤2.定义媒体流：Configuration > Wireless > Media Stream > Tab "Streams"



步骤3.输入图像中所示的流信息：



运行下一命令以检验CLI配置。

```
9800-40-1#sh run | sec media
.
wireless media-stream group movie 239.15.16.17 239.15.16.17
max-bandwidth 5000
wireless media-stream multicast-direct
.
.
```

流信息

- 名称：使用任何字符串来引用您的组播流量
- 组播目标开始/结束：定义客户端可以访问的组播组范围以传输视频。在这种情况下，仅使用一个IP地址。
- 最大预期带宽：视频带宽，且配置为Kbps。范围从0到35000 Kbps

无线电预留控制(RRC)

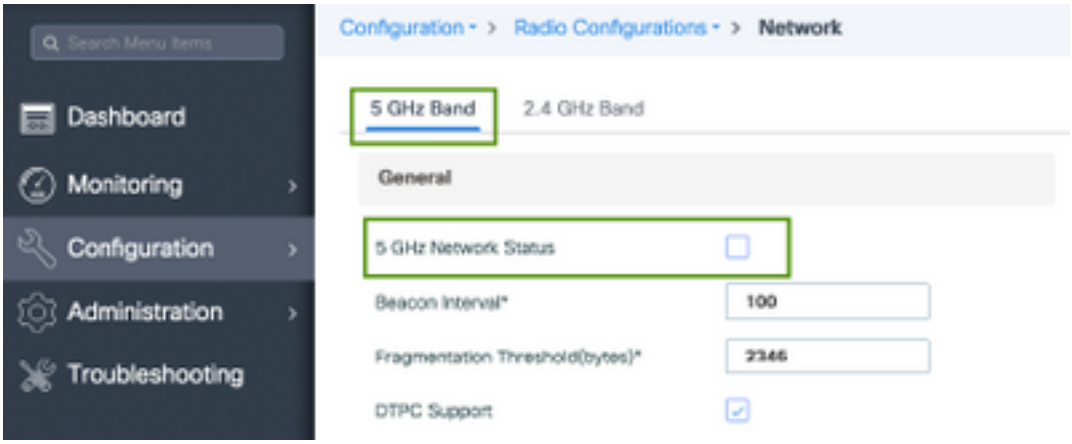
WLC和AP使用这种决策算法来评估AP是否拥有足够的资源来支持对视频流的新请求。

- 平均数据包大小：范围为0到1500字节
- 策略：选择“允许”，以防RRC接受流请求，视频可以流化。
- 优先级：为通过空中数据包选择QoS Up标记
- QoS：选择AP传输视频包时放置视频包的队列。
- 违规: 在RRC拒绝请求流时，可以丢弃请求流或回退到尽力队列。

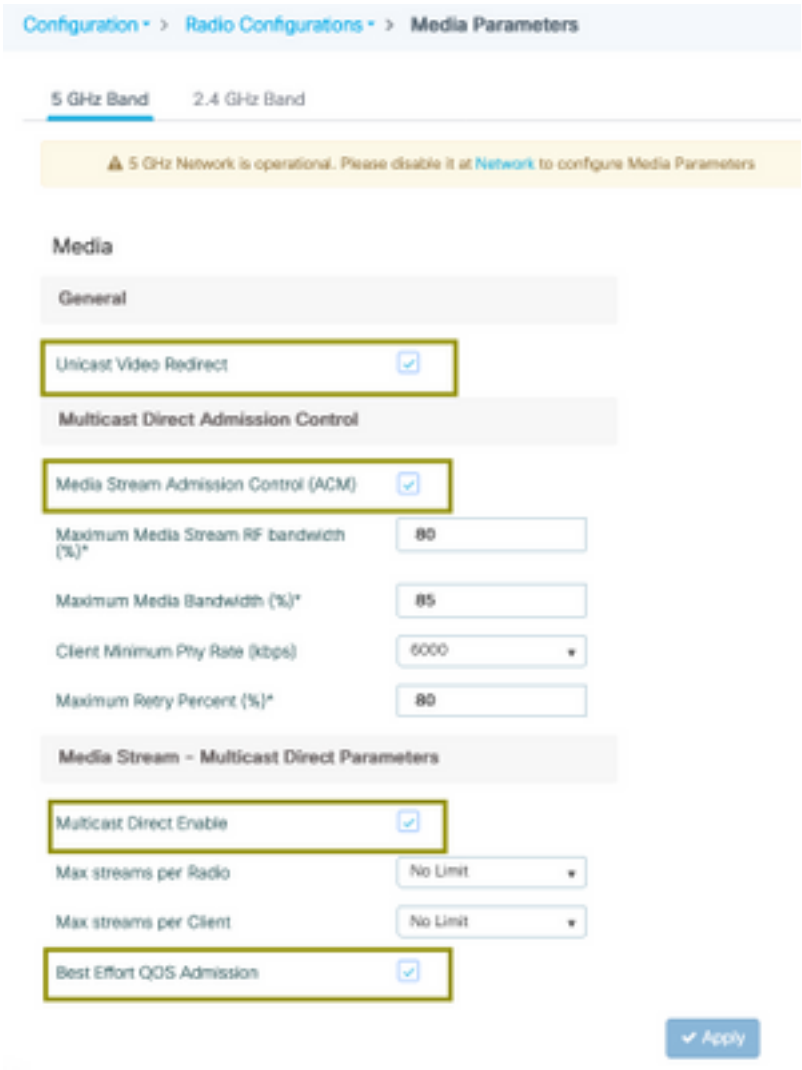
配置频段媒体流

在本例中，媒体流配置为5GHz频段，2.4GHz频段的步骤相同。

步骤1.禁用5 Ghz频段：Configuration > Radio Configurations > Network > Tab 5 GHZ Band



步骤2.配置频段介质参数： Configuration > Radio Configurations > Media Parameters > Tab 5 GHz Band



运行下一命令以检验CLI配置。

```
9800-40-1#sh run all | i 5ghz media|cac media
.
.
ap dot11 5ghz cac media-stream acm
ap dot11 5ghz cac media-stream max-bandwidth 80
ap dot11 5ghz cac media-stream multicast-direct max-retry-percent 80
ap dot11 5ghz cac media-stream multicast-direct min-client-rate 6
ap dot11 5ghz media-stream multicast-direct
ap dot11 5ghz media-stream multicast-direct admission-besteffort
ap dot11 5ghz media-stream multicast-direct client-maximum 0
ap dot11 5ghz media-stream multicast-direct radio-maximum 0
ap dot11 5ghz media-stream video-redirect
```

注意：媒体流准入控制和尽力而为QoS准入是可选配置

常规

- 单播视频重定向：允许单播视频流到无线客户端。

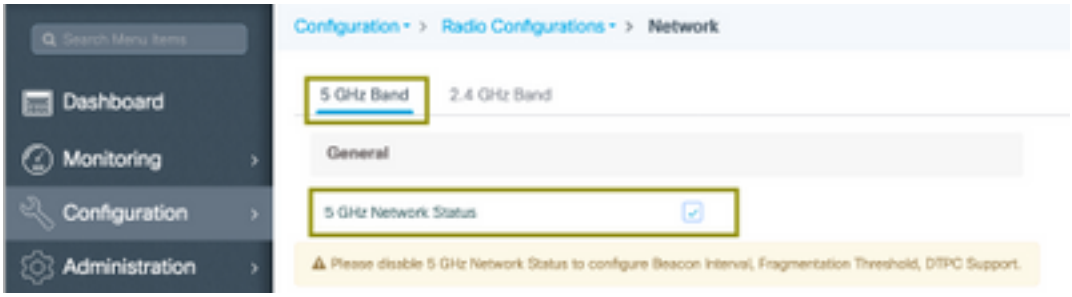
组播直接准入控制

- 媒体流准入控制 — 我们为媒体=语音+视频启用CAC。

媒体流 — 组播直接参数

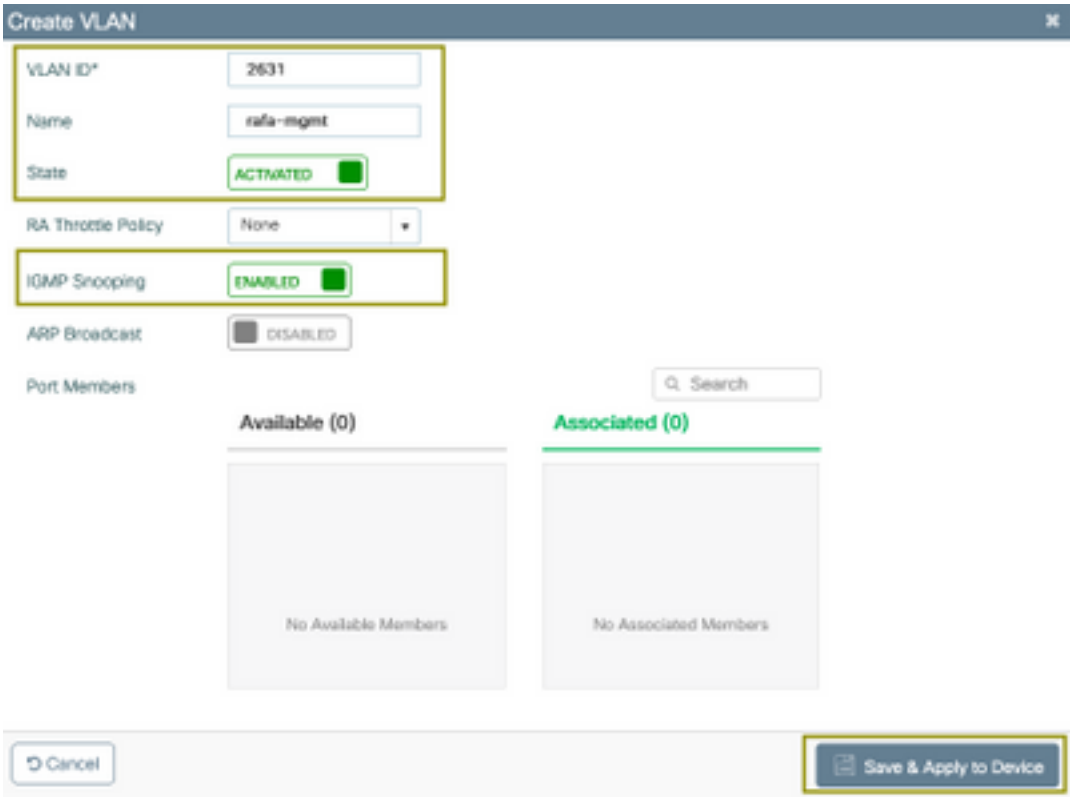
- 组播直接启用：必须启用此复选框
- 每个无线电的最大流数：限制AP无线电上允许的视频流数，在本例中为5Ghz无线电。
- 每个客户端的最大流数：限制每个无线客户端允许的视频流数。
- 尽力而为QoS准入：允许将视频流量回退到尽力而为队列。

步骤3.启用5 Ghz频段：Configuration > Radio Configurations > Network > Tab 5 GHz Band



配置客户端VLAN

创建用于客户端的VLAN并启用IGMP监听。导航至Configuration > Layer 2 > VLAN



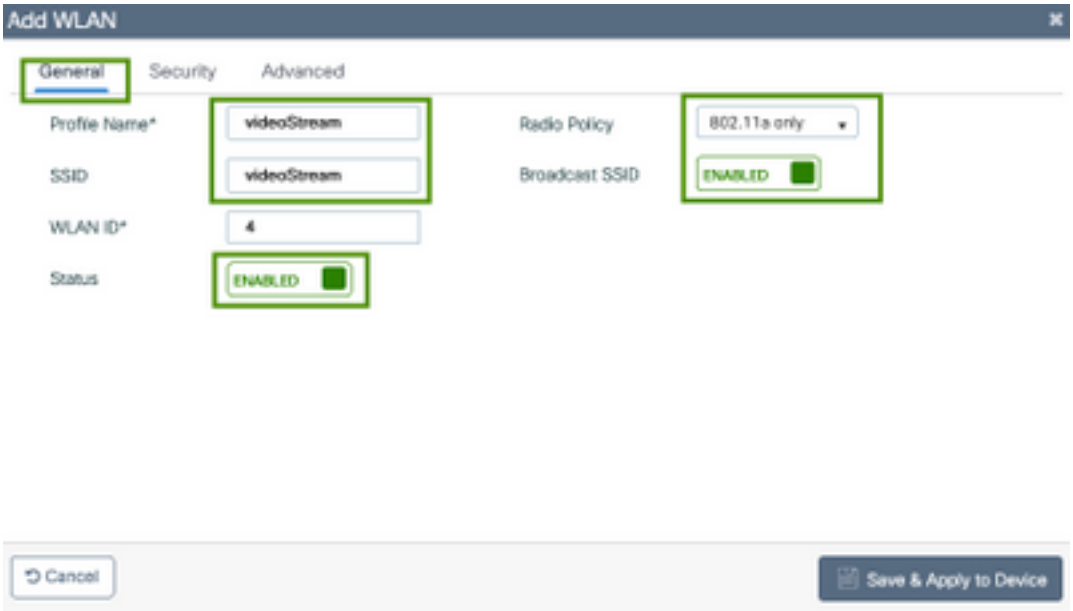
运行下一命令以检验CLI配置。

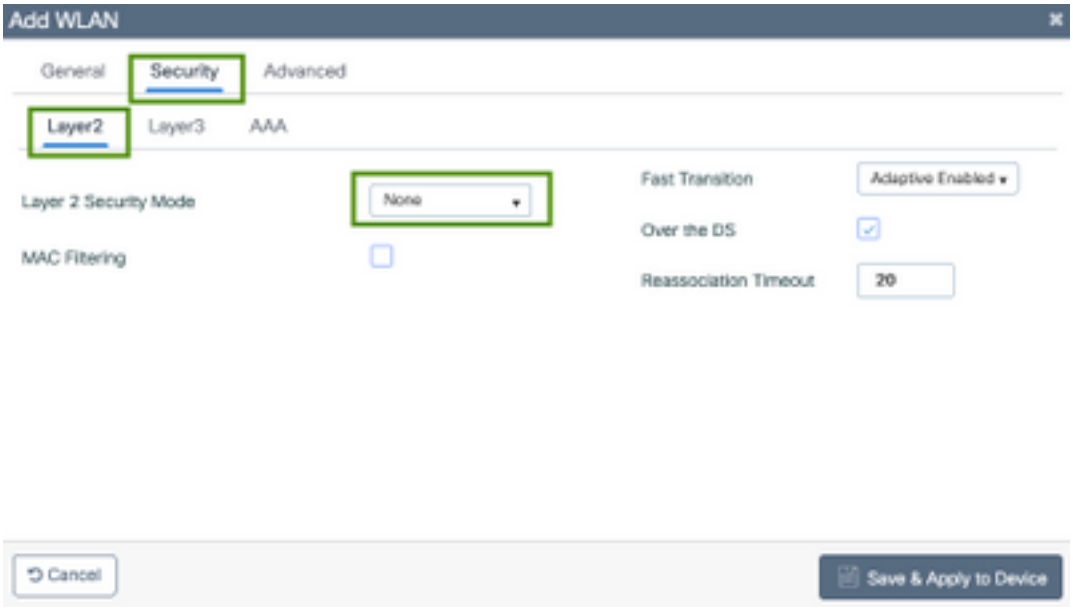
```
9800-40-1#sh run | sec 2631
vlan 2631
name rafa-mgmt
```

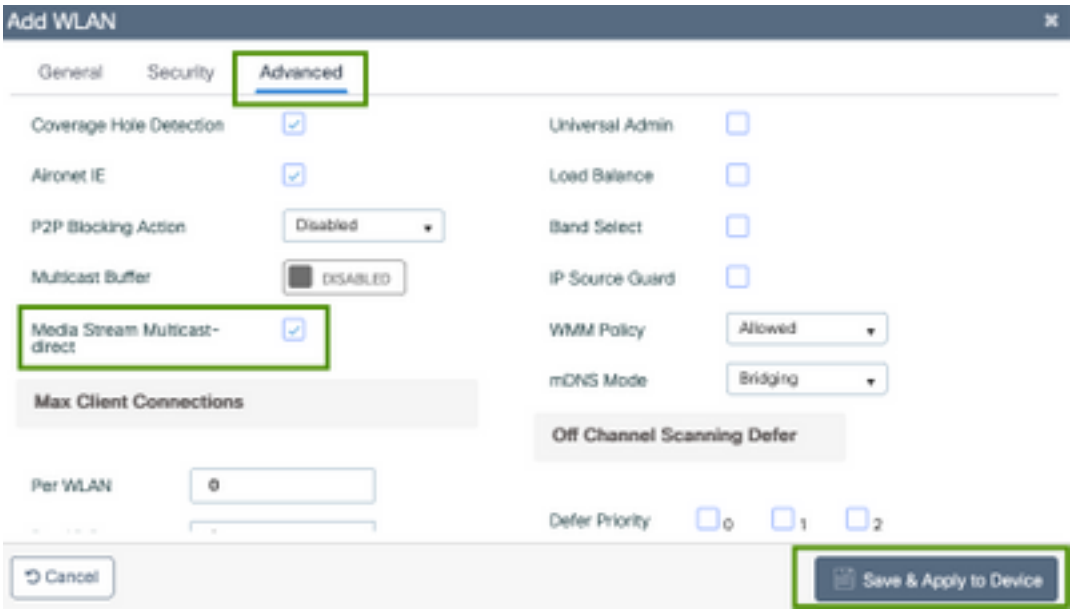
WLAN 配置

在本例中，使用开放式身份验证SSID，仅在5GHz频段广播。执行后续步骤。

导航至：Configuration > Tags & Profiles > WLANs >点击Add





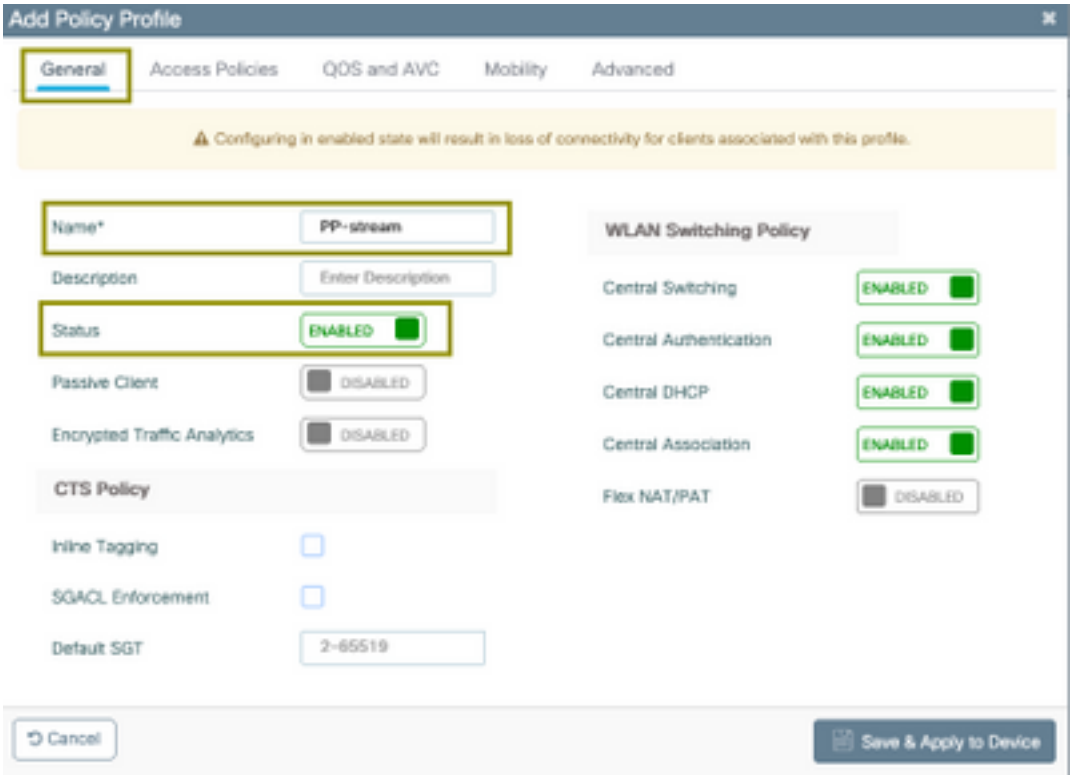


运行下一命令以检验CLI配置。

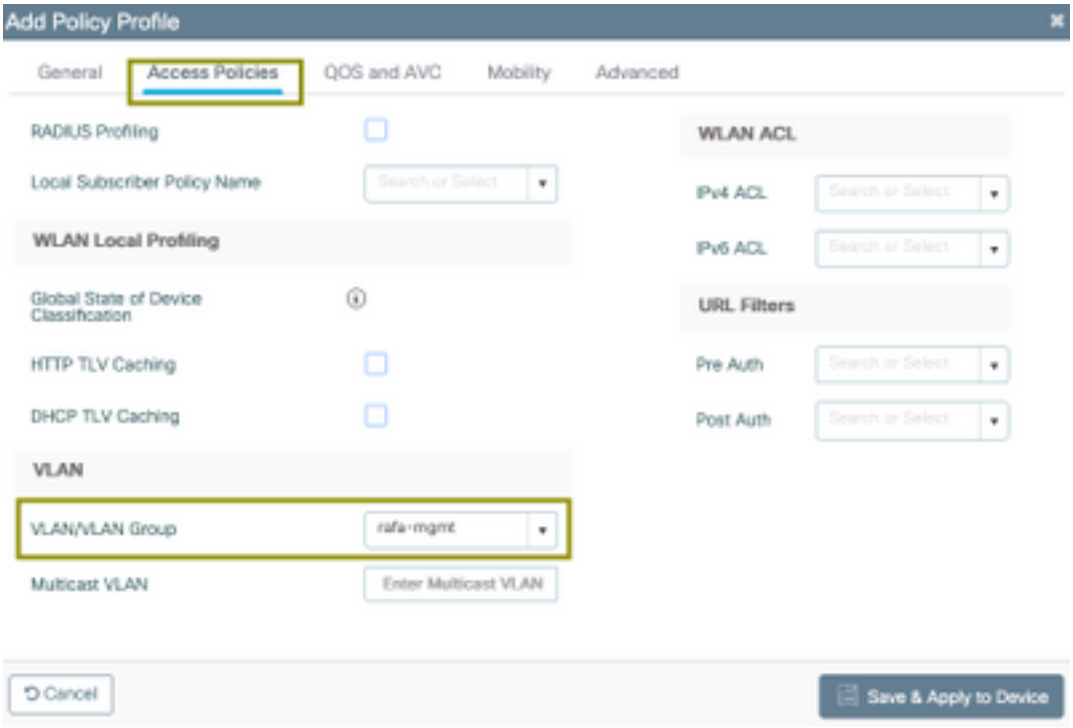
```
9800-40-1#sh run | sec videoStream
wlan videoStream 4 videoStream
media-stream multicast-direct
radio dot11a
no security wpa
no security wpa akm dot1x
no security wpa wpa2 ciphers aes
no shutdown
```

策略配置文件配置

步骤1.创建策略配置文件。配置(Configuration)>标记和配置文件(Tag & Profiles)>策略(Policy)



步骤2.将VLAN映射到策略配置文件

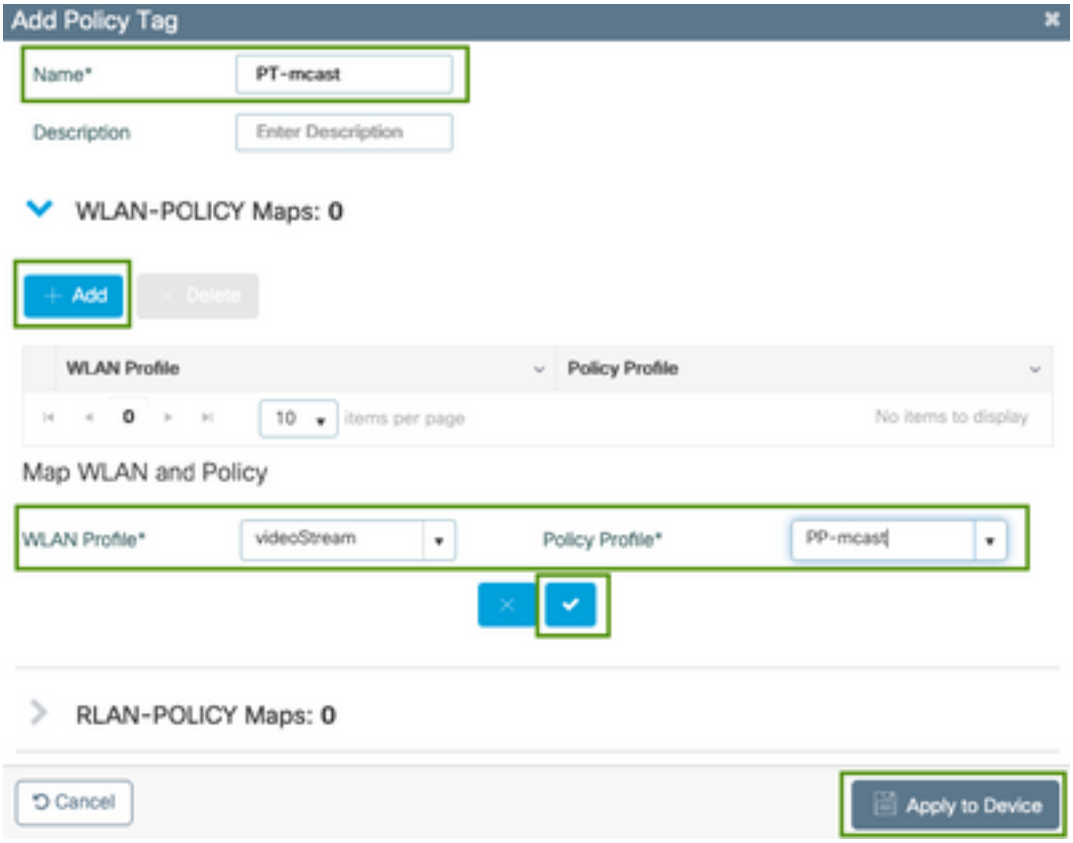


运行下一命令以检验CLI配置。

```
9800-40-1#sh run | sec PP-stream
wireless profile policy PP-stream
vlan rafa-mgmt
no shutdown
```

创建策略标记

将WLAN映射到策略配置文件，导航至配置>标记和配置文件>标记

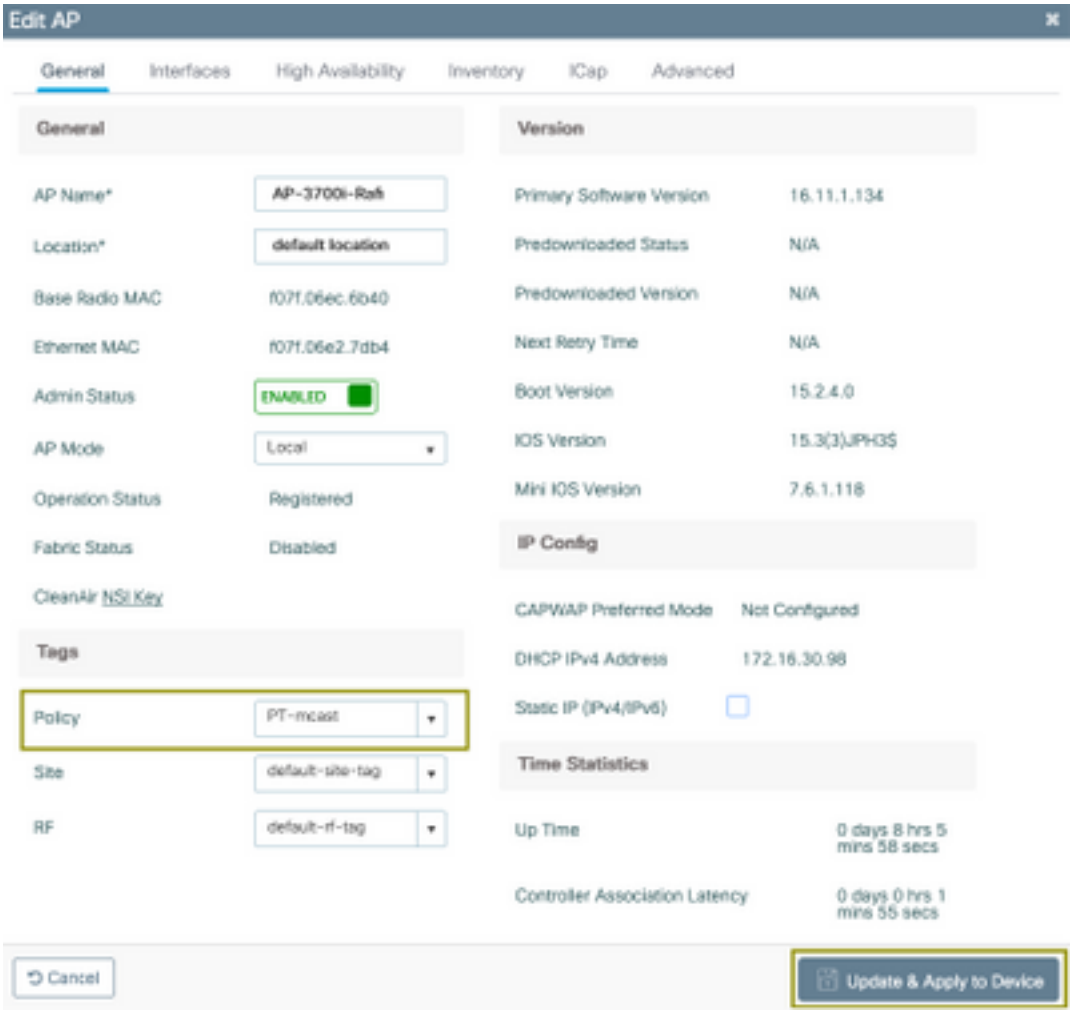


运行下一命令以检验CLI配置。

```
9800-40-1#sh run | sec PT-mcast
wireless tag policy PT-mcast
wlan videoStream policy PP-mcast
policy-tag PT-mcast
```

将策略标记应用于AP

导航至Configuration > Wireless > Access Point >点击AP



运行下一命令以检验配置。

```
9800-40-1#show ap tag summary
Number of APs: 2

AP Name AP Mac Site Tag Name Policy Tag Name RF Tag Name
-------------------------------------------------------------------------------
AP-3702i-Rafi f07f.06e2.7db4 default-site-tag PT-mcast default-rf-tag
```

此时，您可以看到SSID已广播，并且可以连接无线客户端以接收视频流。

验证

查看配置的命令

```
9800-40-1#show wireless media-stream multicast-direct state
Multicast-direct State..................... : enabled
Allowed WLANs:
WLAN-Name WLAN-ID
-------------------------------------------------------
emcast 3
videoStream 4

9800-40-1#show wireless media-stream group summary

Number of Groups:: 1
```

```
Stream Name Start IP End IP Status
------------------------------------------------------------------------------------------------
-----------------
movie 239.15.16.17 239.15.16.17 Enabled

9800-40-1#show wireless media-stream group detail movie

Media Stream Name : movie
Start IP Address : 239.15.16.17
End IP Address : 239.15.16.17
RRC Parameters:
Avg Packet Size(Bytes) : 1200
Expected Bandwidth(Kbps) : 5000
Policy : Admitted
RRC re-evaluation : Initial
QoS : video
Status : Multicast-direct
Usage Priority : 4
Violation : Drop

9800-40-1#show ap dot11 5ghz media-stream rrc

Multicast-direct : Enabled
Best Effort : Enabled
Video Re-Direct : Enabled
Max Allowed Streams Per Radio : Auto
Max Allowed Streams Per Client : Auto
Max Media-Stream Bandwidth : 80
Max Voice Bandwidth : 75
Max Media Bandwidth : 85
Min PHY Rate (Kbps) : 6000
Max Retry Percentage : 80
```

用于验证客户端视频流的命令

要验证客户端连接，请执行以下操作：监控>无线>客户端

```
9800-40-1#show wireless client summary
Number of Local Clients: 1

MAC Address AP Name Type ID State Protocol Method Role
------------------------------------------------------------------------------------------------
-------------------------
886b.6e25.1e40 AP-3700i-Rafi WLAN 4 Run 11ac None Local
```

为了更详细

```
9800-40-1#show wireless client mac-address aaaa.bbbb.cccc detail
```

要验证是否从客户端收到IGMP加入消息，并且WLC已正确创建MGID，请导航至Monitor > General

> Multicast > Layer 3 上面显示，客户端已请求VLAN 2631上组播组239.15.16.17的流量。

要使用已配置的选项验证WLC视频流。监控>常规>组播>媒体流客户端


```
9800-40-1#show wireless multicast group 239.15.16.17 vlan 2631

Group : 239.15.16.17
Vlan : 2631
MGID : 4160

Client List
-------------

Client MAC Client IP Status
-----------------------------------------------------------------
886b.6e25.1e40 172.16.30.64 MC2UC_ALLOWED
```

故障排除

为了排除故障，您可以使用下一个跟踪。

```
set platform software trace wncd chassis active R0 multicast-api debug
set platform software trace wncd chassis active R0 multicast-config debug
set platform software trace wncd chassis active R0 multicast-db debug
set platform software trace wncd chassis active R0 multicast-ipc debug
set platform software trace wncd chassis active R0 multicast-main debug
set platform software trace wncd chassis active R0 multicast-rrc debug
```

您可以使用下一个命令验证跟踪是否已正确激活。

```
9800# show platform software trace level wncd chassis active R0 | i Debug
multicast-api Debug
multicast-config Debug
multicast-db Debug
multicast-ipc Debug
multicast-main Debug
multicast-rrc Debug
```

现在，重现问题

1. 连接无线客户端
2. 请求视频（组播流量）
3. 等待问题发生

4. 收集日志

收集日志。执行运行下一个命令。

```
9800#show logging process wncd internal to-file bootflash:<file-name>.log
Displaying logs from the last 0 days, 0 hours, 10 minutes, 0 seconds
executing cmd on chassis 1 ...
Files being merged in the background, result will be in bootflash:mcast-1.log log file.
Collecting files on current[1] chassis.
# of files collected = 1

btrace decoder: [1] number of files, [40999] number of messages
will be processed. Use CTRL+SHIFT+6 to break.

2019-11-28 20:25:50.189 - btrace decoder processed 7%
2019-11-28 20:25:50.227 - btrace decoder processed 12%
2019-11-28 20:25:50.263 - btrace decoder processed 17%
2019-11-28 20:25:50.306 - btrace decoder processed 24%
2019-11-28 20:25:50.334 - btrace decoder processed 29%
2019-11-28 20:25:50.360 - btrace decoder processed 34%
2019-11-28 20:25:50.388 - btrace decoder processed 39%
2019-11-28 20:25:50.430 - btrace decoder processed 46%
2019-11-28 20:25:50.457 - btrace decoder processed 51%
2019-11-28 20:25:50.484 - btrace decoder processed 56%
2019-11-28 20:25:50.536 - btrace decoder processed 63%
2019-11-28 20:25:50.569 - btrace decoder processed 68%
2019-11-28 20:25:50.586 - btrace decoder processed 73%
2019-11-28 20:25:50.587 - btrace decoder processed 78%
2019-11-28 20:25:50.601 - btrace decoder processed 85%
2019-11-28 20:25:50.607 - btrace decoder processed 90%
2019-11-28 20:25:50.619 - btrace decoder processed 95%
2019-11-28 20:25:50.750 - btrace decoder processed 100%
9800#
```

打开日志文件

```
9800#more bootflash:<file-name.log>
```

AP/WLC中允许的视频流

```
IGMP request from wireless client
2019/11/28 20:18:54.867 {wncd_x_R0-0}{1}: [multicast-ipc] [19375]: (debug): IOSD IGMP/MLD has
sent the WNCD_INFORM_CLIENT with
capwap id = 0x90000006
num_entry = 1
2019/11/28 20:18:54.867 {wncd_x_R0-0}{1}: [multicast-ipc] [19375]: (debug): Source IP Address
0.0.0.0
2019/11/28 20:18:54.867 {wncd_x_R0-0}{1}: [multicast-ipc] [19375]: (debug): Group IP Address
17.16.15.239
2019/11/28 20:18:54.867 {wncd_x_R0-0}{1}: [multicast-ipc] [19375]: (debug): Client IP Address
71.30.16.172
2019/11/28 20:18:54.867 {wncd_x_R0-0}{1}: [multicast-ipc] [19375]: (debug): index = 0:
source = 0.0.0.0
group = 17.16.15.239 . >>> 239.15.16.17 multicast group for video
client_ip = 71.30.16.172 >>> 172.16.30.71 client ip address
client_MAC = a4f1.e858.950a
vlan = 2631, mgid = 4160 add = 1
.....
```

```
MGID table updated with client mac address
2019/11/28 20:18:54.867 {wncd_x_R0-0}{1}: [multicast-db] [19375]: (debug): Child table records
for MGID 4160 are
2019/11/28 20:18:54.867 {wncd_x_R0-0}{1}: [multicast-db] [19375]: (debug): Client MAC:
a4f1.e858.950a
....



Starting RRC algoithm to assess whether AP has enough resources or not
2019/11/28 20:18:54.867 {wncd_x_R0-0}{1}: [multicast-rrc] [19375]: (debug): Submiting RRC
request
2019/11/28 20:18:54.869 {wncd_x_R0-0}{1}: [multicast-rrc] [19375]: (debug): Video Stream
Admitted: passed all the checks
2019/11/28 20:18:54.869 {wncd_x_R0-0}{1}: [multicast-rrc] [19375]: (debug): Approve Admission on
radio f07f.06ec.6b40 request 3664 vlan 2631 dest_ip 17.16.15.239 decision 1 qos 4 admit_best 1
.....

WLC matching requested group to the ones defined on WLC
2019/11/28 20:18:54.869 {wncd_x_R0-0}{1}: [multicast-db] [19375]: (debug): Matching video-stream
group found Start IP: 17.16.15.239, End IP: 17.16.15.239 that contains the target group IP
address 17.16.15.239
.....



Adding client to multicast direct
2019/11/28 20:18:54.869 {wncd_x_R0-0}{1}: [multicast-db] [19375]: (debug): Add rrc Stream Record
for dest 17.16.15.239, client a4f1.e858.950a
```

AP/WLC中不允许视频流，因此，AP在尽力而为队列上发送组播流量。

在这种情况下，允许无线客户端执行视频流，但AP没有足够的资源来允许具有视频QoS的流量，因此AP将客户端移至尽力而为队列。查看下一个图像

从调试

```
Starting RRC algoithm to assess whether AP has enough resources or not
.....
2019/11/28 17:47:40.601 {wncd_x_R0-0}{1}: [multicast-rrc] [19375]: (debug): Submiting RRC
request
2019/11/28 17:47:40.603 {wncd_x_R0-0}{1}: [multicast-rrc] [19375]: (debug): RRC Video BW Check
Failed: Insufficient Video BW for AP
2019/11/28 17:47:40.603 {wncd_x_R0-0}{1}: [multicast-rrc] [19375]: (debug): Video Stream
Rejected. Bandwdith constraint......
2019/11/28 17:47:40.603 {wncd_x_R0-0}{1}: [multicast-rrc] [19375]: (debug): Approve Admission on
radio f07f.06ec.6b40 request 3626 vlan 2631 dest_ip 17.16.15.239 decision 0 qos 0 admit_best 1
....
```